

CLAIMS

1. A method of reducing fluorescence in recycled pulp comprising:
processing waste paper to form a mixture comprising pulp and fluorescent agents;
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adding chlorine dioxide solution to the mixture to interact with the fluorescent agents thereby reducing fluorescent activity of the fluorescent agents.
2. The method of claim 1, further comprising adding polymeric material to the
10 mixture.
3. The method of claim 2, wherein the chlorine dioxide solution is added to the mixture after the polymeric material is added to the mixture.
- 15 4. The method of claim 3, wherein the chlorine dioxide solution is added to the mixture within a period of time of less than 1 minute after the polymeric material is added to the mixture.
- 20 5. The method of claim 1, further comprising adjusting the pH of the mixture to a value between about 9.8 and about 10.4 prior to adding the chlorine dioxide solution to the mixture.
- 25 6. The method of claim 1, further comprising adjusting the pH of the mixture to a value of about 10.2.
7. The method of claim 1, further comprising adjusting the consistency of the mixture to be between about 8% and about 12% prior to adding the chlorine dioxide solution to the mixture.
- 30 8. The method of claim 1, further comprising adjusting the consistency of the mixture to be about 10% prior to adding the chlorine dioxide solution to the mixture.

9. The method of claim 1, further comprising adding a bleaching agent to the mixture in a bleaching step prior to adding the chlorine dioxide solution to the mixture.

10. The method of claim 9, wherein the bleaching agent is hydrogen peroxide.

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11. The method of claim 9, further comprising controlling the flow rate of the bleaching agent added to the mixture in the bleaching step such that the concentration of the bleaching agent is substantially zero after the bleaching step.

10 12. The method of claim 9, further comprising controlling the temperature of the mixture to be greater than about 200 degrees F and less than 230 degrees F in the bleaching step.

13. The method of claim 9, further comprising adjusting the pH of the mixture to be
15 between about 11.0 and 11.4 at the start of the bleaching step.

14. The method of claim 13, further comprising adjusting the pH of the mixture to be about 11.2 at the start of the bleaching step.

20 15. The method of claim 1, comprising adding chlorine dioxide solution in a concentration of between about 1.0 grams/liter and about 3.0 grams/liter to the mixture.

16. The method of claim 1, comprising adding chlorine dioxide solution in a concentration of between about 2.0 grams/liter and about 2.4 grams/liter to the mixture

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17. The method of claim 1, further comprising adjusting the oxidation reduction potential of the mixture to a value of less than or equal to zero after the step of adding chlorine dioxide solution.

30 18. The method of claim 17, comprising adjusting the oxidation reduction potential of the mixture to a value of between about 0 and about -200.

19. The method of claim 17, wherein the oxidation reduction potential is adjusted by adding a neutralizing solution to the pulp mixture.

20. The method of claim 19, wherein the neutralizing solution is sodium bisulfite.

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21. The method of claim 1, further comprising processing the pulp mixture after adding the chloride dioxide solution to form a pulp sheet.

10 22. The method of claim 21, wherein the pulp sheet has a fluorescence component of brightness of less than about 2.0%.

23. The method of claim 21, wherein the pulp sheet has a fluorescence component of brightness of substantially zero.

15 24. The method of claim 21, wherein the pulp sheet has essentially no phosphorescence activity.

25. The method of claim 21, further comprising processing the pulp sheet to form paper.

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26. The method of claim 25, wherein the paper has a fluorescence component of brightness of less than about 2.0%.

25 27. The method of claim 25, wherein the paper has a fluorescence component of brightness of substantially zero.

28. The method of claim 25, wherein the paper has essentially no phosphorescence activity.

30 29. The method of claim 25, wherein the paper is suitable for use in a food grade application.

30. The method of claim 1, wherein the fluorescent agents are whitening agents.

31. A recycled pulp or paper article produced according to the method of claim 1.
32. A recycled pulp or paper article having a fluorescence component of brightness
5 of less than about 2.0% and essentially no phosphorescence activity.
33. The recycled pulp or paper article of claim 32, wherein the fluorescence
component of brightness is less than about 1.0%
- 10 34. The recycled pulp or paper article of claim 32, wherein the fluorescence
component of brightness is substantially zero.
35. The recycled pulp or paper article of claim 32, wherein the article is used in a
food grade application.